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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/390,554	09/03/1999	DANILO PAU	98AG07053137	7097

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EXAMINER

PARSONS, CHARLES E

ART UNIT PAPER NUMBER

2613

DATE MAILED: 08/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/390,554

Applicant(s)

PAU ET AL.

Examiner

Charles E Parsons

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 5-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao in view of Ericsson et al.

Claim 5, 8, 9 and 12: A method of calculating the discrete cosine transform (DCT) of blocks of pixels of an image, comprising the steps of:

defining first subdivision blocks as range blocks, having a fractional and scalable size $N/2^i \times N/2^j$, where i is an integer; defining second subdivision blocks of $N \times N$ pixels as domain blocks, shift-able by intervals of $N/2^i$ pixels; and calculating, in parallel, the DCT of 2^i range blocks of a domain block of $N \times N$ pixels of the image. (See Zhao page 74 column 2 disclosed by the applicant as pertinent art, wherein he subdivides the blocks into range and domain blocks. Furthermore he shifts the domain blocks vertically and horizontally as is claimed. While he does not teach the calculation in parallel, Ericsson does. In column 3 lines 6-20 Ericsson clearly teaches the benefits of processing images in parallel rather than in sequence. Therefore it would have been obvious to one of ordinary skill in the art, to implement parallel processing techniques in order to reduce processing times.)

Claim 8 is further limited to classifying the transformed range blocks according to their relative complexity represented by a sum of values of three AC coefficients; applying a fractal transform in the DCT domain to data of the range blocks whose complexity classification exceeds a pre-defined threshold and only storing a DC coefficient of the range blocks with a complexity lower than the threshold, while identifying a relative domain block to which the range block in a transformation belongs that produces a best fractal approximation of the range block; (See pages 74-75 of Zhao clearly teaching this.)

calculating a difference between each range block and its fractal approximation; quantizing the difference in the DCT domain by using a quantization table preestablished in consideration of human sight characteristics; coding the quantized difference by a process based on probabilities of quantization coefficients; and storing or transmitting code of each range block compressed in the DCT domain and the DC coefficient of each uncompressed range block. (See Zhao page 76 column 2.)

Claim 6, 10. A method according to Claim 5, wherein the step of calculating comprises the steps of:

- a) ordering the pixels in the range blocks of a certain dimension by rearranging input pixels in 2^i vectors of 2^j components; (See column 2 page 74 of Zhao)
- b) calculating, in parallel, 2^i monodimensional DCTs by processing the vectors defined in the step a);
- c) arranging output sequences of the monodimensional DCTs relative to the 2^i vectors;
- d) completing the calculation in parallel of 2^i bidimensional DCTs by processing output sequences of monodimensional DCTS produced in step c); and
- e) arranging output sequences of bidimensional DCTs generated in step d) in 2^i vectors of bidimensional DCT coefficients. (See Zhao pages 75-76 where he clearly teaches each of these steps. The applicant has change the phraseology but the algorithms as shown in Zhao clearly teach the steps as claimed.)

Claim 7, 11. A method according to Claim 6, wherein the step of calculating 2^i monodimensional DCTs in parallel in step b) and the step of completing the parallel calculation of 2^i bidimensional DCTs of step d) are performed by subdividing the sequences resulting from step a) and from step c), respectively, in groups of scalar elements, calculating the sums and differences thereof by way of adders and subtractors and by reiterately multiplying the sum and difference results by respective coefficients until completing the calculation of the relative DCT coefficients, respectively monodimensional and bidimensional. (See Zhao pages 75-76 showing formulas that require adders, subtractors and multipliers to carry out the operations.)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E Parsons whose telephone number is 703-305-3862. The examiner can normally be reached on M-TH 7AM to 4:30PM Fri 7AM to 3:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on 703-305-4856. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

CEP
August 7, 2002



CHRIS KELLEY
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